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Laser-Assisted Uvulopalatoplasty: Evaluation of Postoperative Discomfort and the Effectiveness of This Procedure

Lynda L. Schiebert, RN,* Joyce E. Zeiler, RN, Lynn R. Bandaruk, RN, and Kathleen E. Spagnola, RN

Beckman Laser Institute and Medical Clinic, Irvine, CA 92715

Background and Objective: **The Beckman Laser Institute and Medical Clinic of the University of California at Irvine began to offer laser-assisted uvulopalatoplasty to treat snoring in October 1993. Current literature at that time advised that patients should expect mild or minimal pain after each treatment. Soon, it became apparent that those instructions needed modifying as most of the patients complained of severe pain.**
Study Design/Materials and Methods: **Patient surveys were developed to evaluate postoperative pain, pain management, the rate of improvement after each treatment, and the success or failure of the procedure to reduce their snoring.**
Results: **Severity of pain reported by patients declined.**
Conclusion: **A combination of two primary factors reduced pain reported: 1) improved patient education regarding expected outcomes and pain management and 2) addition of anti-inflammatory medications. Lasers Surg. Med. 20:157–163, 1997.**

Key words: pain management; snoring; uvulopalatoplasty

INTRODUCTION

According to the American Academy of Otolaryngology–Head and Neck Surgery (Alexandria, VA), 45% of normal adults snore at least occasionally. Snoring is thought to occur as a result of an airflow obstruction while sleeping. Often, the problem is caused by an elongated uvula and relaxed soft palate [2]. The reasons for reducing or eliminating snoring are multiple. Physically, snoring may cause fatigue and irritability due to interrupted sleep. Snoring is even thought by some to progress to occlusive sleep apnea in many individuals because "the mechanical injury produced by years of heavy snoring leads to airway narrowing, loss of tissue tone, and uncoupling of the muscle-tissue linkage (i.e., normal muscle tone in the tensor palatini muscles may not elevate the palate because of its bulk, length, and floppiness"[1].

Psycho-socially, snoring is often an embarrassment to the snorer and an irritation to their mates and those in close proximity to the snoring sleeper. One patient from this study reported a reluctance to fall asleep on airplane trips because he was afraid of disturbing the other passengers with his loud snoring. Since this patient had to frequently fly long distances, it is easy to see how this fear of embarrassment also deprived him of necessary sleep. Another patient reported that her grandchildren would not stay overnight at her home because Granny's snoring could be heard throughout the house. Most couples in this study reported sleeping in separate bedrooms because of the snoring.

Over the years, there have been various nonsurgical and surgical methods employed to treat the problem of snoring. These treatments have met with varying degrees of success. Examples of nonsurgical solutions include the use of chin

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*Correspondence to: Lynda Schiebert, R.N., Beckman Laser Institute & Medical Clinic, 1002 Health Sciences Road East, Irvine, CA 92715.

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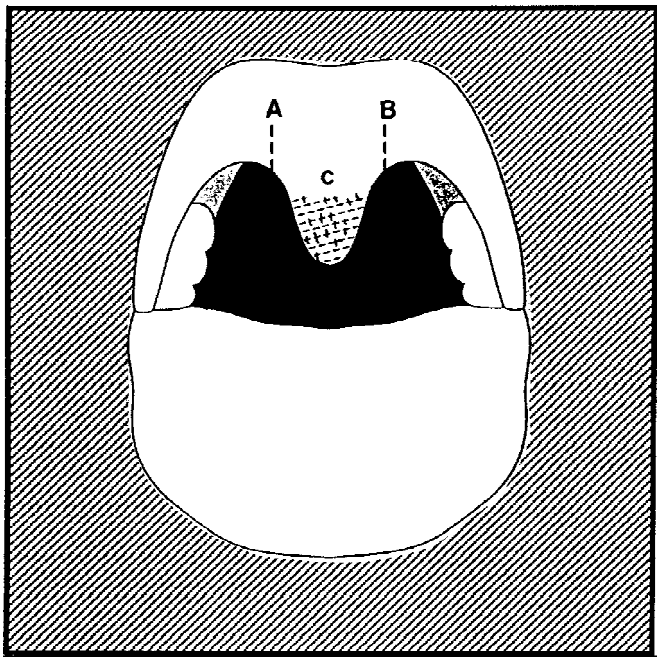


Fig. 1. Line drawing of open mouth. The dotted lines indicate the areas where the soft palate is cut with the CO_2 laser, and the cross-hatching indicates ablation of uvula tissue.

straps, tennis balls sewn into the backs of pajamas, intra-oral devices to maintain the airway during sleep, and electronic devices that shock the patient out of sleep should snoring occur [3].

Surgical methods have evolved to reduce the redundant tissue in the soft palate and uvula that occur in snoring and obstructive sleep apnea. However, due to a minimum 1-day hospital stay and the risks of this procedure (i.e., general anesthesia, too much tissue removed leading to nasal regurgitation, voice changes), they have been reserved mainly for treating obstructive sleep apnea and not for the person with simple snoring problems [4].

The laser-assisted uvulopalatoplasty (LAUP) technique which reshapes the uvula and soft palate was described by Dr. Y.V. Kamami [6] of France (Fig. 1). The treatment is done in stages which are scheduled 4–6 apart. After treatment, there is less obstruction in the pharynx due to the enlarged air space.

The Beckman Laser Institute and Medical Clinic (BLIMC) of the University of California at Irvine began to offer LAUP to treat snoring in October 1993. Initially, the staff adapted pre- and post-treatment instructions based on a literature review and information gleaned from other physicians who had done the procedure. At their consultation appointments, patients were told to expect mild or minimal pain after each treatment. Additionally, some patients were shown videoclips from various news programs of interviews with LAUP patients. These clips were all very positive, showing patients who reported minimal-to-no pain after the procedure.

Two surgeons were independently doing LAUP procedures using the Sharplan CO_2 laser at BLIMC. Although they later took a more aggressive surgical approach, in the beginning both doctors were making trenches in the soft palate on each side of uvula and ablating the tip of the uvula (Fig. 1). In terms of the literature previously cited, the surgeons were initially taking a very conservative approach to this surgery. Both doctors used 18–19 W of energy. Each procedure lasted only 5–10 minutes. One surgeon did prescribe antibiotics postoperatively. Yet, it soon became apparent to the nursing staff at BLIMC that our post-treatment instructions for this procedure should be modified as most of the patients were complaining of severe pain, not mild as the literature reported.

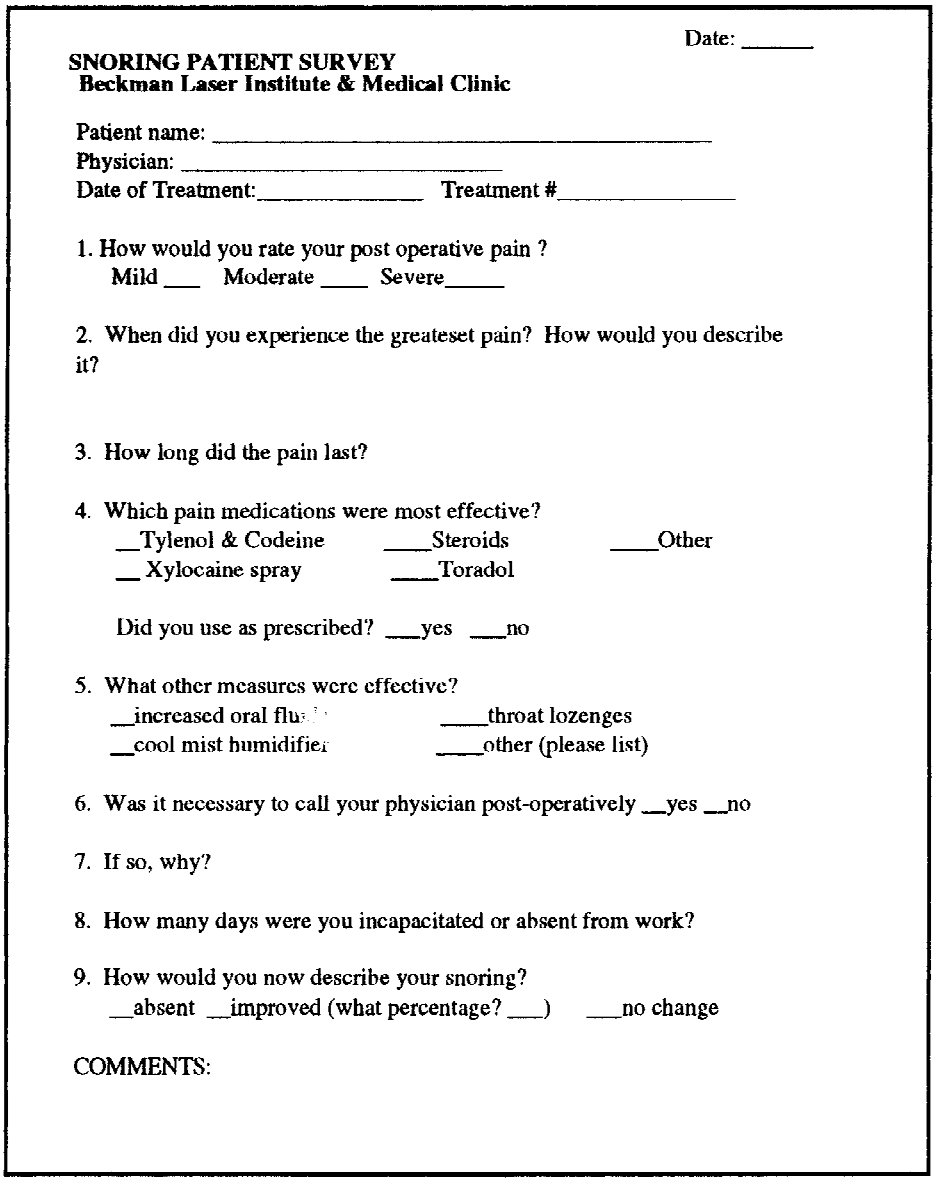
MATERIALS AND METHODS

A patient survey was developed to evaluate the postoperative pain, the pain management, and the rate of improvement after each treatment (Fig. 2). This questionnaire was completed by patients when they returned at 4–6 week intervals for subsequent treatment. A total of 134 post-treatment surveys were completed. An exit survey (Fig. 3) was also developed for patients who had completed treatment or decided not to proceed with further treatment. The exit survey addressed the patient's perception of his/her overall pain, the success or failure of the procedure to reduce the snoring, and comments regarding the postoperative course. Forty-four exit surveys were returned.

RESULTS

Sixteen surveys were randomly selected from the first 6 months of doing LAUP, and then compared with 16 randomly selected surveys from the following 6 months (Fig. 4). Reports of severe pain after first treatment dropped from 75% to 44%. This decrease may be attributed to improved patient preparation, instruction, and revised medication regimen. In spite of the pain level reported, 70% of the patients reported no work lost, and 15% reported missing only 1 day of work.

Of the 134 surveys completed following each



Date: _____

SNORING PATIENT SURVEY
Beckman Laser Institute & Medical Clinic

Patient name: _____
Physician: _____
Date of Treatment:_____ Treatment #_____

1. How would you rate your post operative pain ?
   Mild ___ Moderate ____ Severe_____

2. When did you experience the greateset pain? How would you describe it?

3. How long did the pain last?

4. Which pain medications were most effective?
   __Tylenol & Codeine ____Steroids ____Other
   __ Xylocaine spray ____Toradol

   Did you use as prescribed? ___yes ___no

5. What other measures were effective?
   __increased oral flu[illegible] ____throat lozenges
   __cool mist humidifier ____other (please list)

6. Was it necessary to call your physician post-operatively __yes __no

7. If so, why?

8. How many days were you incapacitated or absent from work?

9. How would you now describe your snoring?
   __absent __improved (what percentage? ___) ___no change

COMMENTS:

Fig. 2. A patient survey to evaluate the postoperative pain, the pain management, and the rate of improvement after each treatment.

treatment, 83% of the treatments resulted in moderate-to-severe discomfort as shown in Table 1. The final exit surveys show that 81% of the patients who completed treatment described their overall pain as moderate to severe. This number substantiates the 83% rate reported after individual treatments. Table 1 also demonstrates a marked decrease in discomfort with subsequent treatments with 45% (32/70) of the *initial* treatments resulting in severe pain, while only 23% (8/34) reported severe pain with the *second* treatment.

TABLE 1. Severity of Pain Following Specific Treatments as Reported in Treatment Surveys

	Severity of pain reported				
LAUP treatment	0 = None	1 = Mild	2 = Moderate	3 = Severe	Total surveys
First	1	7	30	32	70
Second	1	5	20	8	34
Third		7	12	5	24
Fourth		1	4	1	6
Total					134

Name of patient: _____
Date:_____
Physician: _____

FINAL SURVEY FOR SNORING PROCEDURE

Beckman Laser Institute & Medical Clinic

1. How many treatments have you had?
2. How would you describe your snoring?
   __absent ___improved (percentage___) ____no change
3. Describe your post operative pain overall.
   __mild ___moderate __severe
4. Are you satisfied with the results?
5. Would you recommend the procedure to others?
6. How has this affected your life?
7. Was pre-operative teaching helpful?

Suggestions/Comments

Fig. 3. An exit survey developed for patients who had completed treatment or decided not to proceed with further treatment. The exit survey addressed the patient's interpretation of their overall pain, the success or failure of the procedure to reduce their snoring, and comments regarding their postoperative course.

Final exit surveys were given to our patients (Fig. 3). Of the 44 returned, 77% reported a reduction in snoring by more than 75%. An overwhelming majority of 91% showed a decrease in snoring of 50% or more. Furthermore, it appears that only three treatments were required for a 75% reduction in snoring in 75% of those polled (Fig. 5).

DISCUSSION

As a result of these surveys, amended treatment patient instructions were created (Fig. 6). These instructions were stressed verbally, and a written copy was given as a reference to each pa-

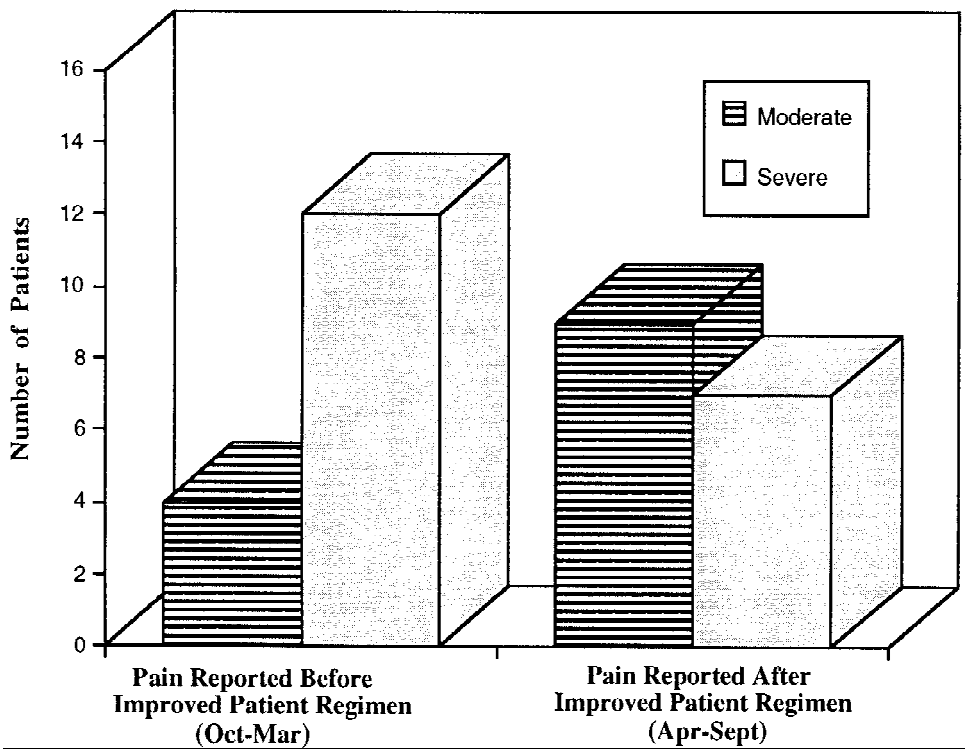


Fig. 4. Pain comparison reported by LAUP patients from the first 6 months compared to second 6 months. Sixteen surveys selected randomly from the first 6 months compared to the second 6 months reveal that reports of severe pain dropped from 75% to 44%.

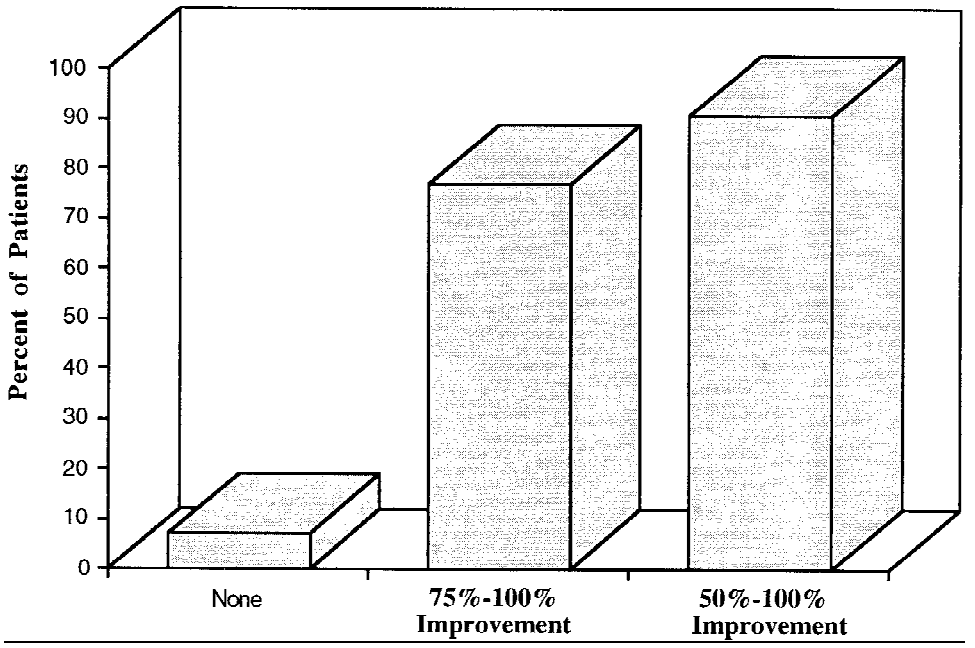


Fig. 5. Percent of patient-reported improvement in reduction of snoring. Of 44 patients responding, 77% reported snoring decreased by more than 75%; 91% reported a decrease of 50% or more and are happy with the results; 7% or three patients reported no improvement.

tient. One such factor was the patient's expectations regarding pain. As previously mentioned, the literature available reported mild sore throat to be the norm following this procedure. When confronted with pain or discomfort that was much worse than predicted, patients obviously became anxious and concerned, thus increasing their discomfort even further. Our first step was to adequately prepare the patient for the degree of discomfort they might experience. A teaching plan was developed over a period of 3 months.

Further evaluation of patient's comments regarding their postoperative course led to the development of a revised patient care plan. Some patients were not drinking fluids due to difficulty swallowing. This led to dehydration of the mucous membranes. At least 8 glasses of water a day were stressed. Patients were also having difficulty with liquids that were too hot or too cold. They were instructed to drink fluids at room temperature. Diet also presented a problem with many patients. They reported difficulties eating. When questioned further, they admitted to eating spicy, salty foods. Patient education regarding adherence to a soft, bland diet was stressed. Many patients complained of severe dryness and discomfort in their throat when they awoke. A cool mist humidifier was suggested with good results for those patients.

Patients were initially prescribed analgesics and throat spray for pain control. These medications quickly proved inadequate. Anti-inflammatory drugs, either steroidal or non-steroidal, were added by the physicians with excellent results.

Although their initial approach to this surgical procedure was conservative, both surgeons eventually began resecting the uvula approximately 25–50% instead of only ablating the tip. This more aggressive approach did not increase the level of discomfort reported by the patients. To the contrary, our studies show the severity of reported pain has declined since the initial treatments were done at our Institute.

In conclusion, our final survey indicates that most patients required three surgeries, which decreased their snoring by 75–100%. The majority of patients were experiencing severe pain when this procedure was initially begun at our facility. The addition of anti-inflammatory medications and improved patient education regarding expected outcomes and pain management reduced the amount of discomfort reported.

Of the patients polled, 89% were satisfied with the results. Although they rated their postoperative pain level as moderate to severe, most said they would recommend the procedure to others. Patients who reported decreased snoring also

PATIENT POST OPERATIVE INSTRUCTIONS
FOR LASER ASSISTED UVULOPALATOPLASTY
Beckman Laser Institute & Medical Clinic

1. Keflex Elixer-250 mg every 6 hours for 7 days. Please finish all this medicine.

2.Tylenol Elixir or Tylenol with codeine Elixir every 3-4 hours for pain as needed.

3. Medrol dose pack as directed. Do not take this medicine if you have a history of peptic ulcer disease. If you have any doubt about whether you can take this medicine, please check with the doctor.

4. Gargle with 1 teaspoon peroxide in a cup of warm water twice a day for two weeks.

5. Cloraseptic Lozenges or Cepecol Lozenges every 2 hours as needed for pain or throat discomfort.

6. Soft diet for 2 days following procedure. Please make sure you are drinking the equivalent of at least 8 large cups of water a day. Avoid carbonated, very cold, or very hot drinks.

7. NO ASPIRIN or MOTRIN. Avoid spicy, salty foods.

8. Call the doctor's office (day or night) for bleeding, severe pain, or any questions that may arise.

9. Expect the most discomfort to occur 2-5 days after the procedure. There is almost always ear discomfort associated with this procedure. This is normal and expected.

10. After surgery, snoring may be louder until the appropriate number of procedures have been performed. Thus, do not be alarmed if your partner complains of louder than usual snoring after each procedure.

11. You may feel your uvula for the first time in your life after the first procedure. This is normal and should not alarm you.

12. Using a bedside humidifier may help reduce throat discomfort.

Fig. 6. Post-treatment patient instructions developed as a result of information gathered from patient surveys.

reported increased energy levels, decreased irritability, and more restful sleep (Fig. 7).

In most cases, their mates reaped similar benefits. As one patient stated, "I think it was worthwhile for me and my wife. She tells me my snoring is much improved—sometimes almost non-existent. She now sleeps next to me every night and it's a joy to me to have her close." Our study has shown LAUP to be a viable laser treatment alternative for selected patients.

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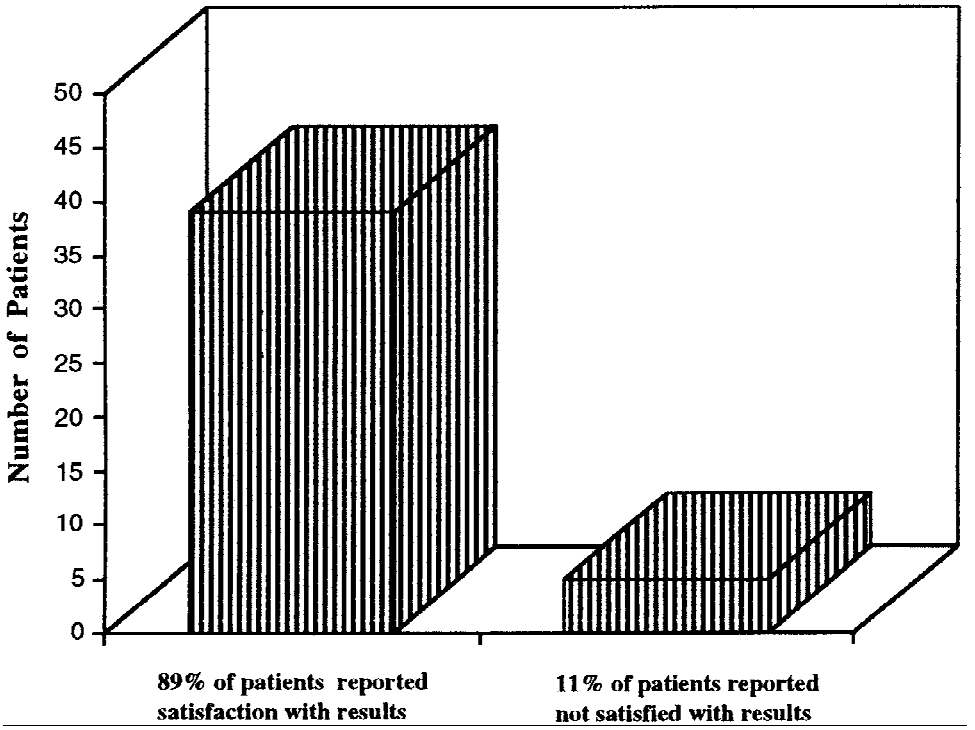

Fig. 7. Patient satisfaction reported at completion of LAUP treatments. From a total of 44 patients who were polled at the conclusion of their LAUP treatment, 39 reported that they were satisfied and five reported that were not.

like to acknowledge the surgeons involved with this project for their considerable input, Drs. Roger Crumley and Al Aly.

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